



Basic-ultrabasic magmatism on the South of the Siberian Platform

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Схематическая карта
мощности земной коры

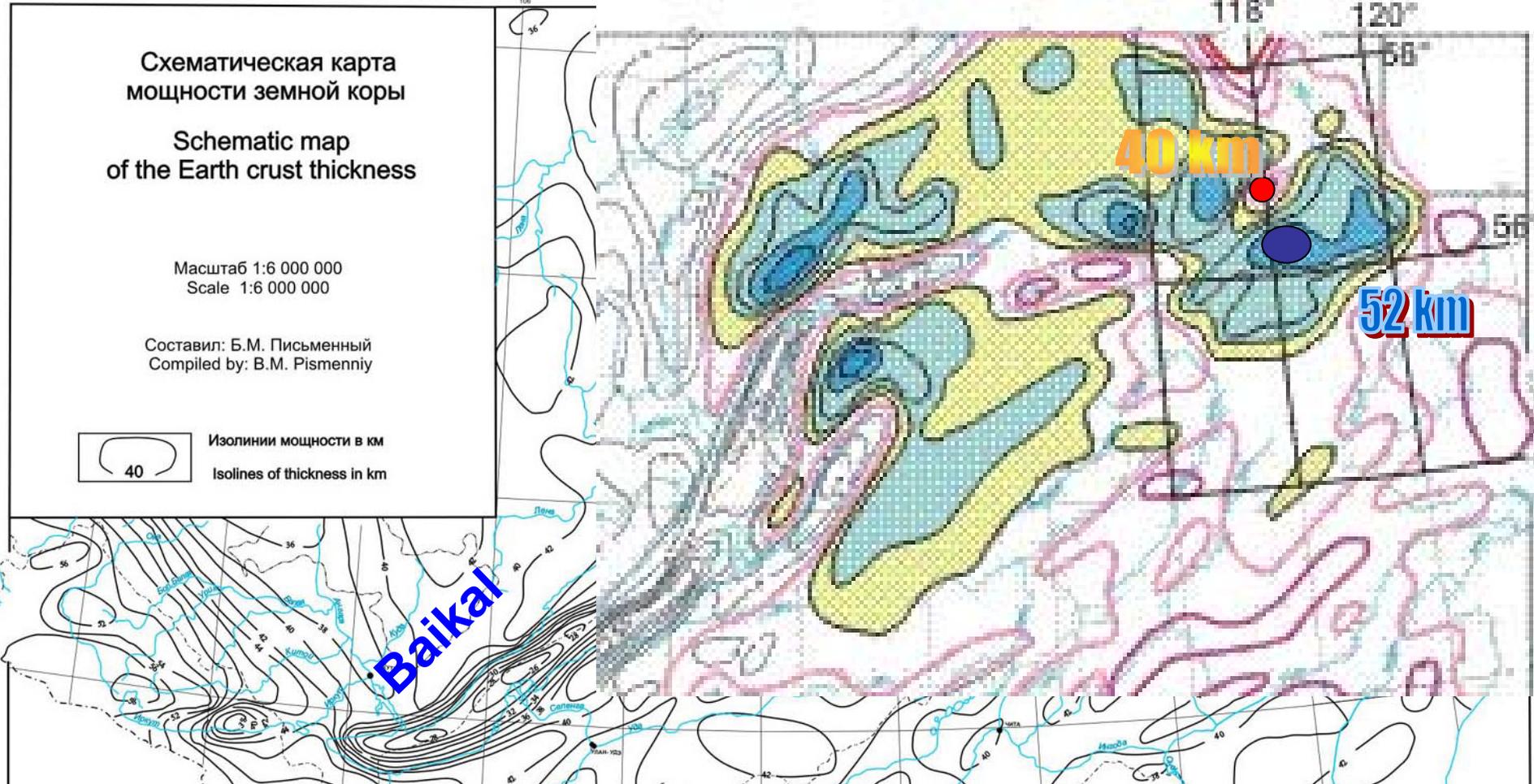
Schematic map
of the Earth crust thickness

Масштаб 1:6 000 000
Scale 1:6 000 000

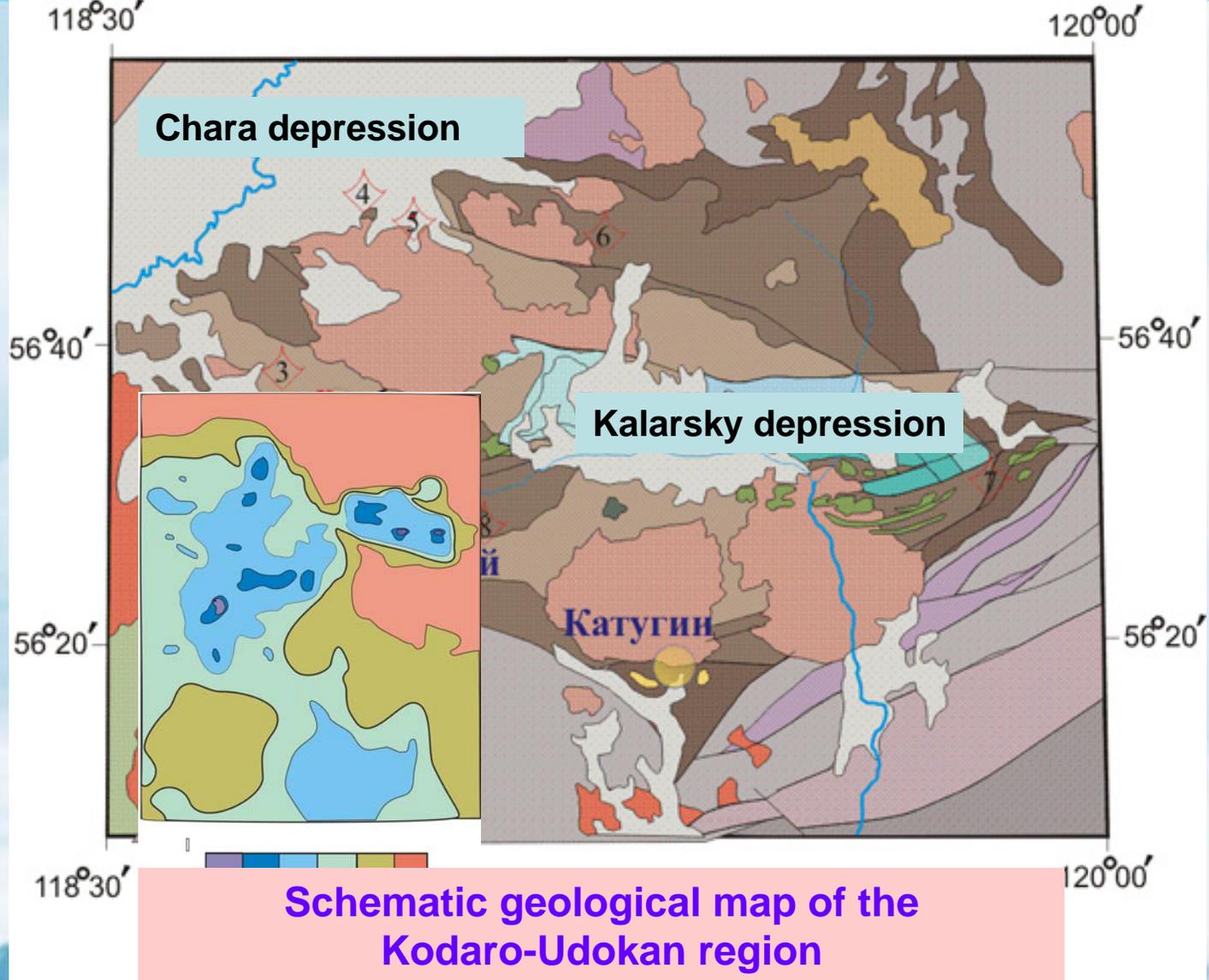
Составил: Б.М. Письменный
Compiled by: B.M. Pismenniy

Изолинии мощности в км
Isolines of thickness in km

40

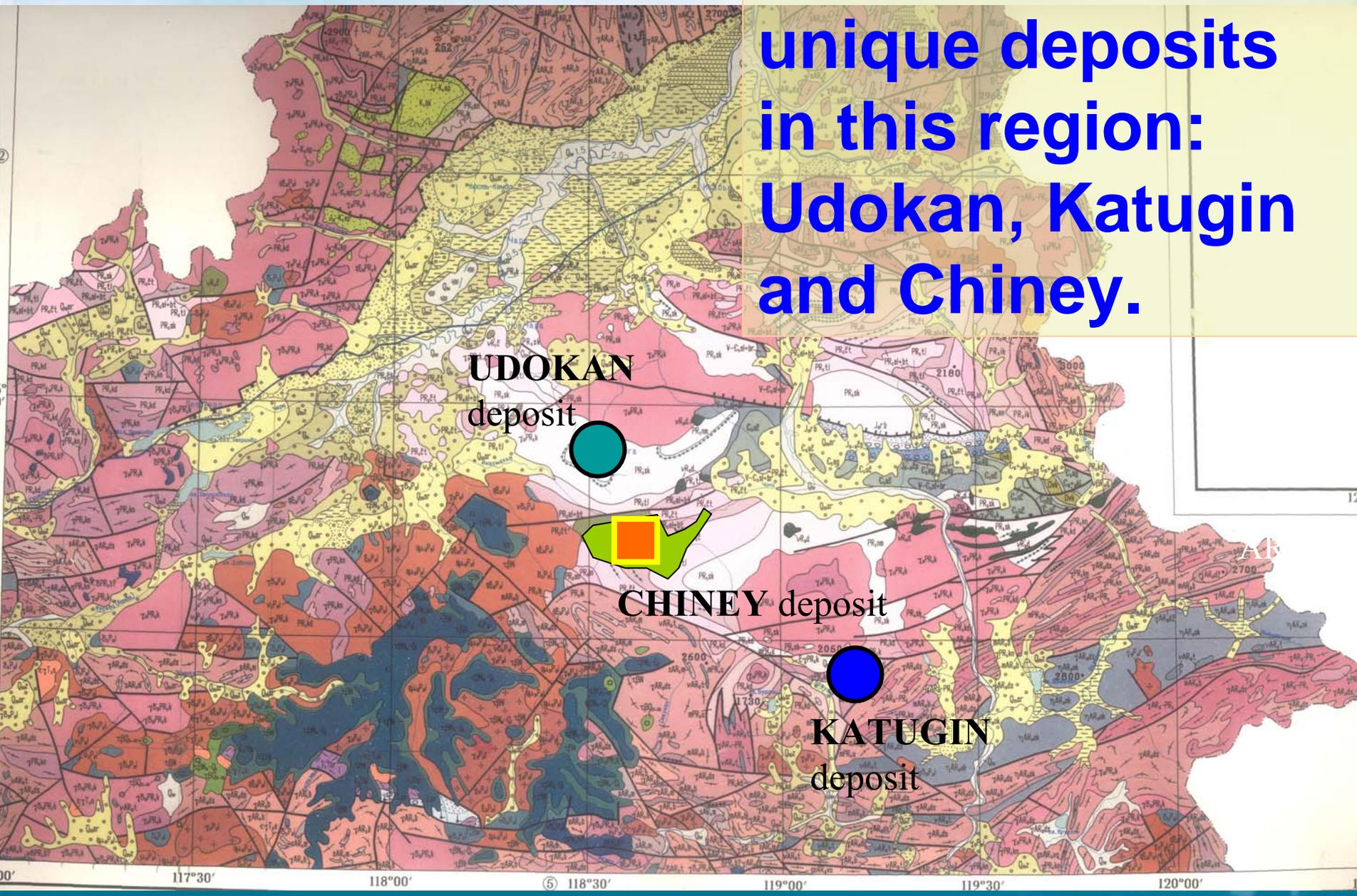


The North Transbaikalia is characterized by very thick crust (about fifty two kilometers). Inside this anomalous block of the crust there is a narrow zone which has thickness of the crust only forty kilometers. This zone is represented by Chara trough in modern relief. Boundaries of this block coincide with the boundaries of the Kodaro-Udokan depression which consists of the PR₁ sandstones of the Udokan formation.



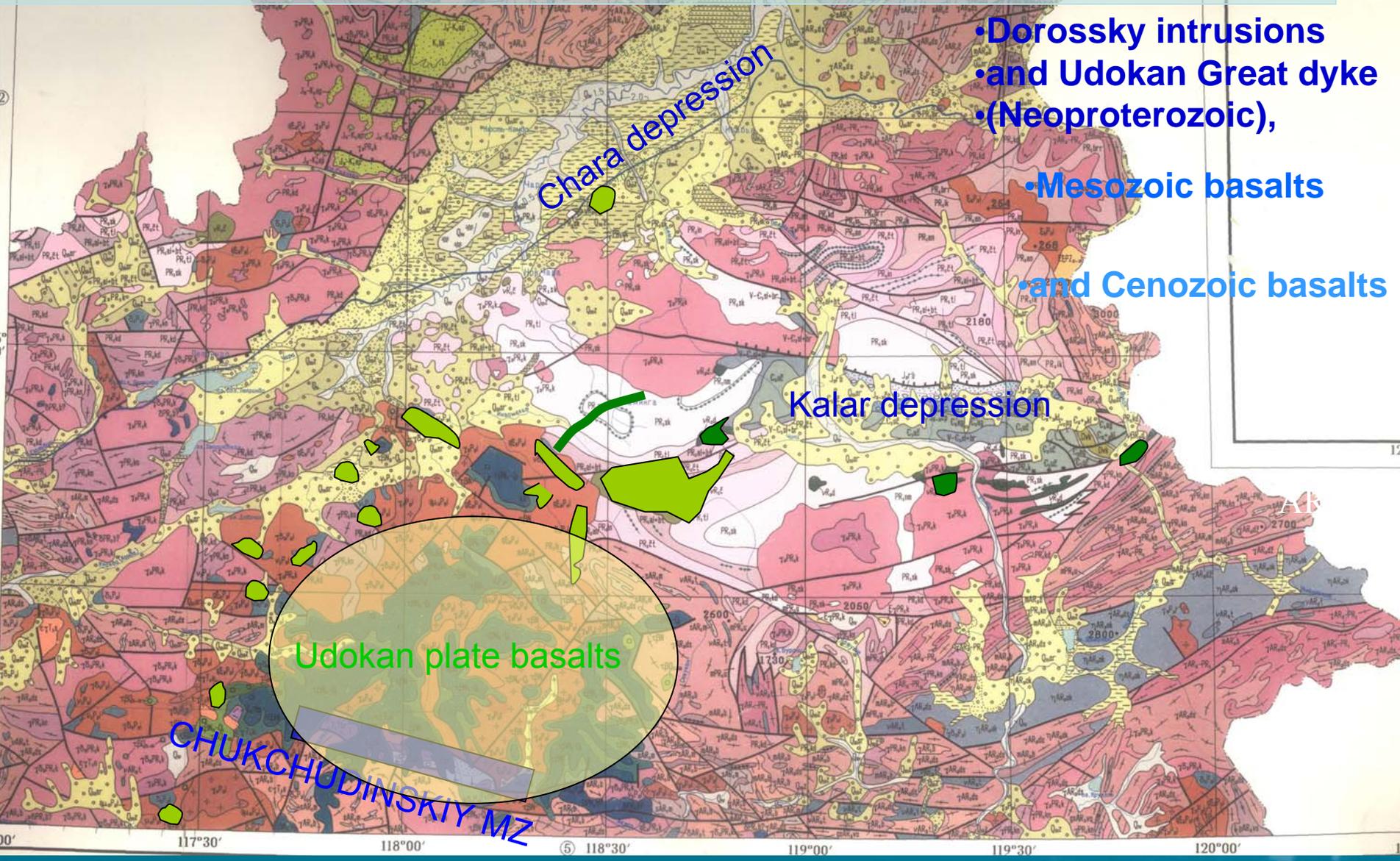
The great anomaly of magnetic field is typical for this region. It shows that there are a lot of basic-ultrabasic bodies here. They are Chiney anortozite-gabbronorite massif, outcrops gabbro in periferical part of the Lurbum massif (Mylove massif) and ctr.

There are three unique deposits in this region: Udokan, Katugin and Chiney.

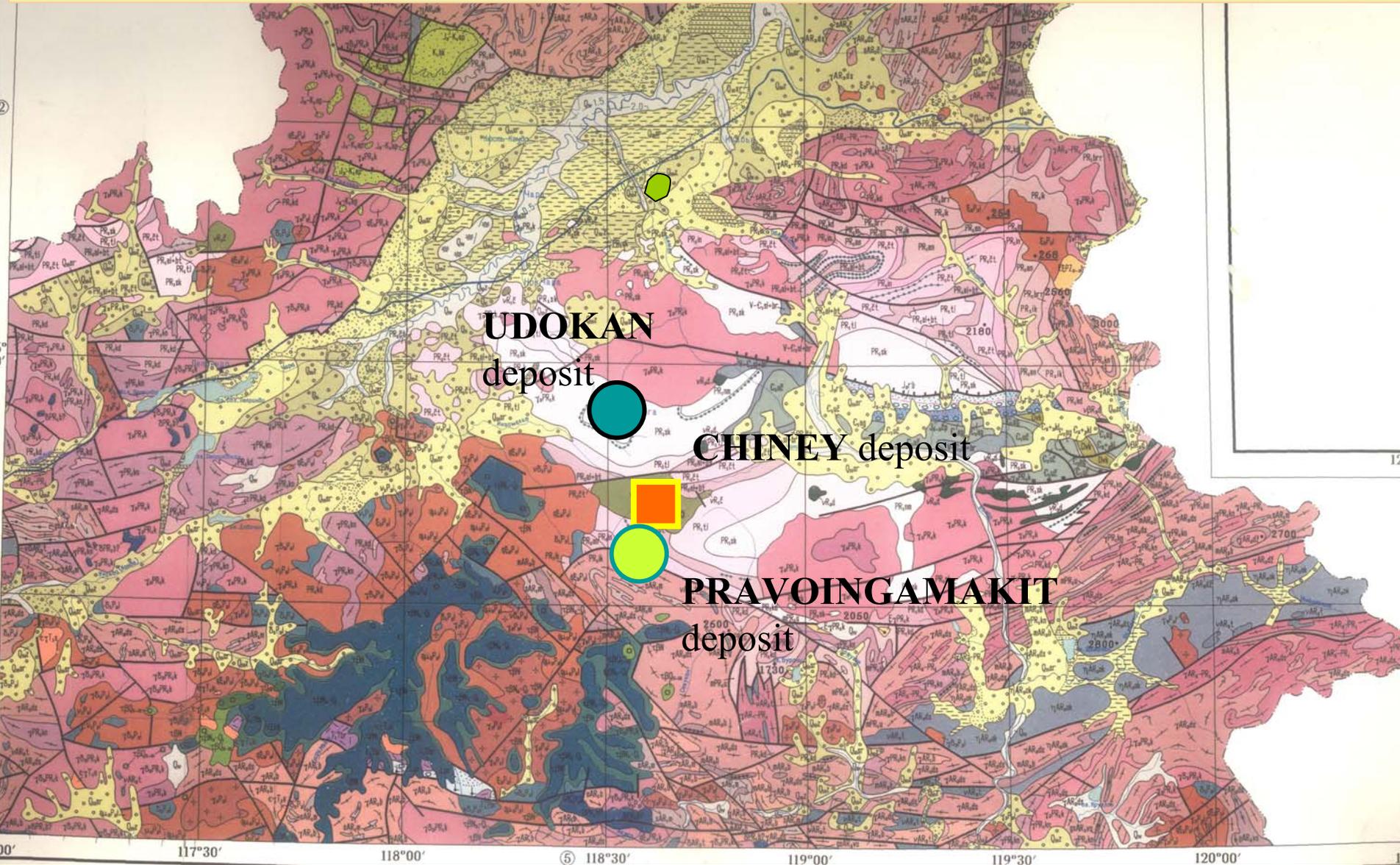


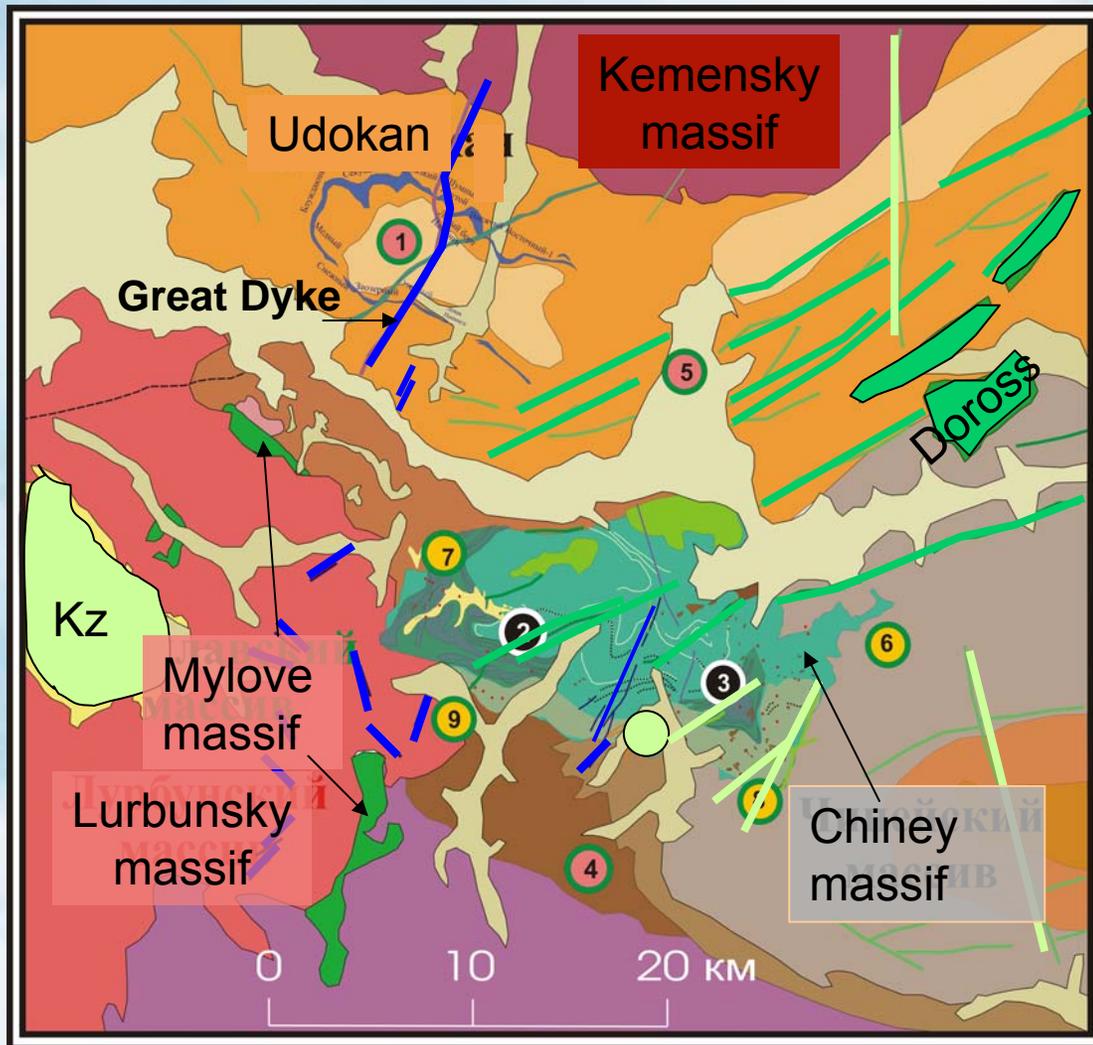
•It shows that there are a lot of basic-ultrabasic bodies here. They are Chiney and Luctur anortozite-gabbronorite massifs (Paleoproterozoic), outcrops gabbro in periferical part of the Lurbum massif (Mylove massif) and ctr.

- Dorossky intrusions
- and Udokan Great dyke (Neoproterozoic),
- Mesozoic basalts
- and Cenozoic basalts



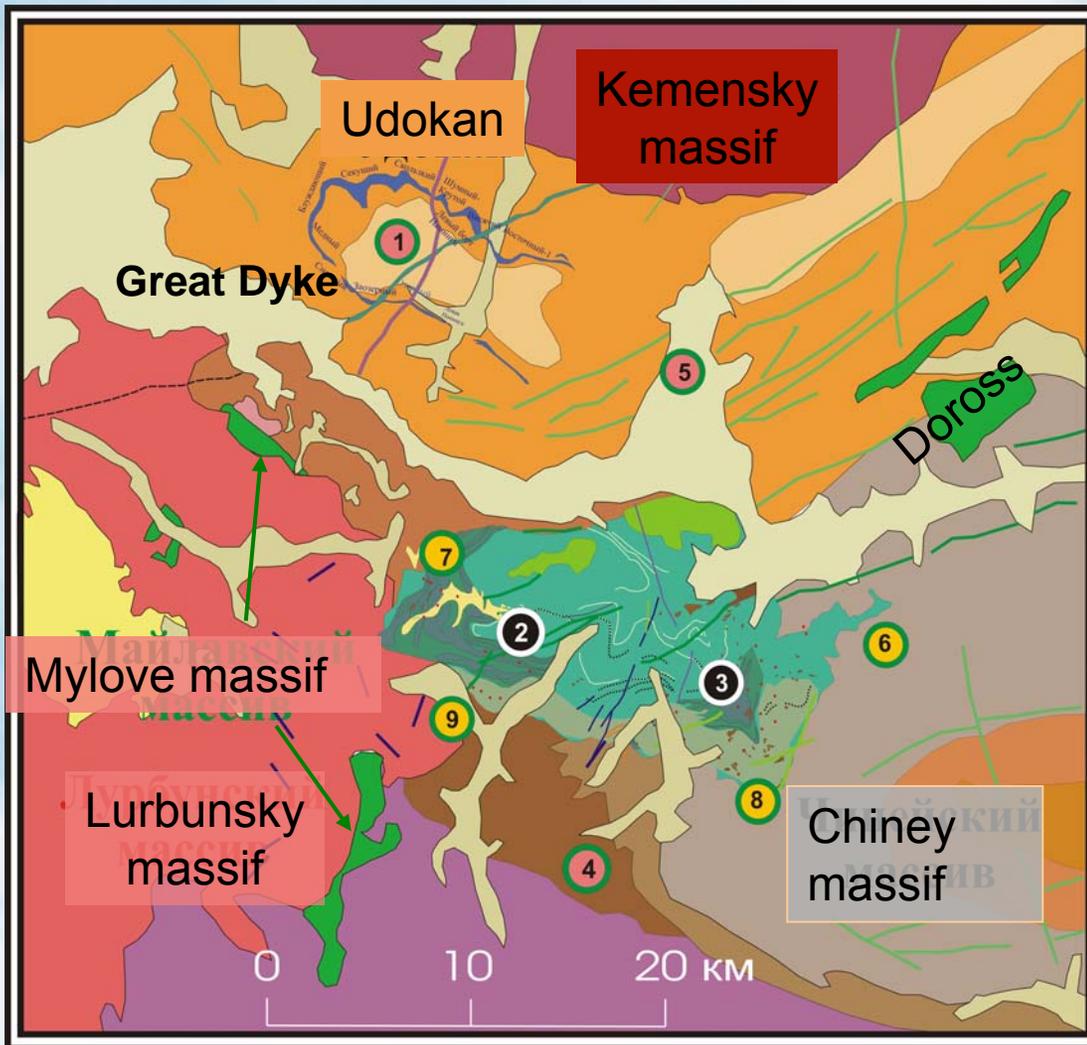
All of them were formed during Early Proterozoic epoch which was very productive in terms of Cu. But up to now the relationships and origin of numerous deposits and ore manifestations haven't been established yet. Genetic relations between different types of copper deposits are very important for theory which helps to find new perspective ore objects.





Geological map of the area of the Chiney massif

For the first time magmatic, hydrothermal and sedimentary copper ores in the North Transbaikalia are regarded as different parts of common the Udokan-Chiney ore-magmatic system. Many kilometers of country-rock displacements along the deep faults exposed heterogeneous components of this system. This fact allows us study these different fragments: Chiney massif, Mylove massif. Then dykes and basic bodies of Udokan and doross complex (PR₂) and Udokan KZ basalts were formed.



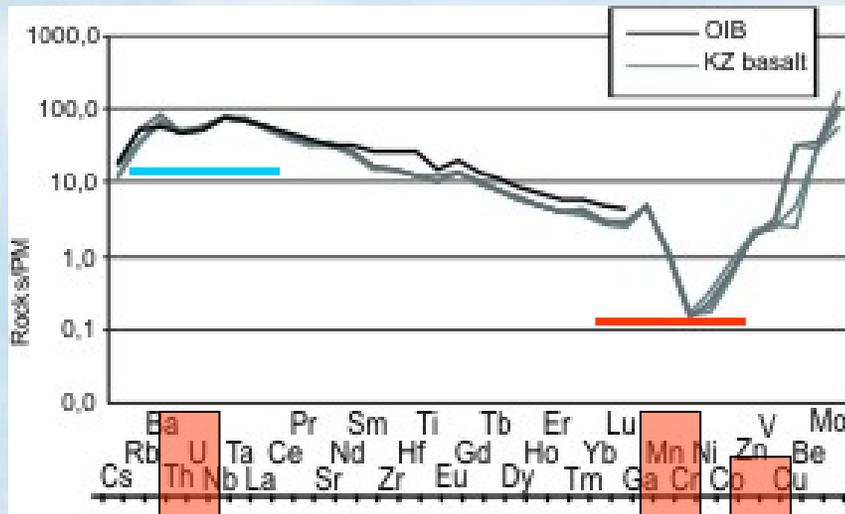
Deposits

- 1-Udokan
- 2-Etyrko
- 3-Magnitnoe
- 4-Pravoingamakitskoe
- 5-Sakinskoe
- 6-Rudnoe
- 7-kontaktovoe
- 8-Solnechnoe
- 9-Skvoznoe

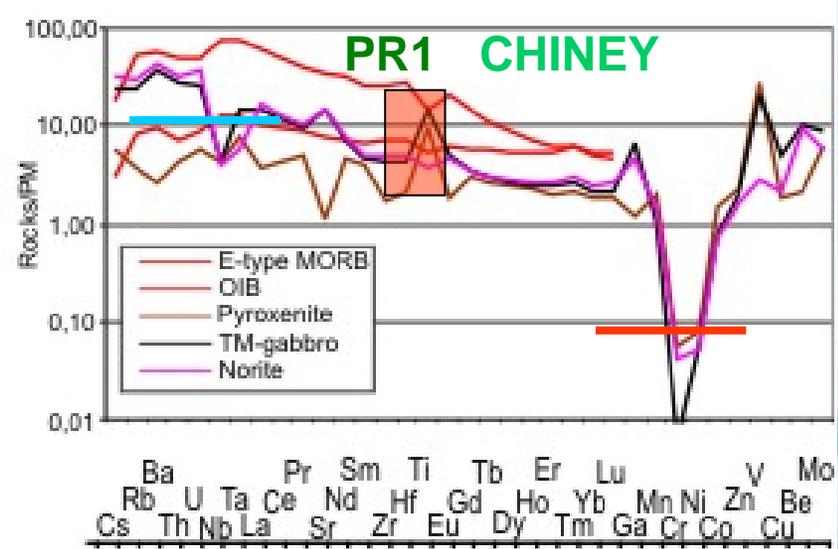
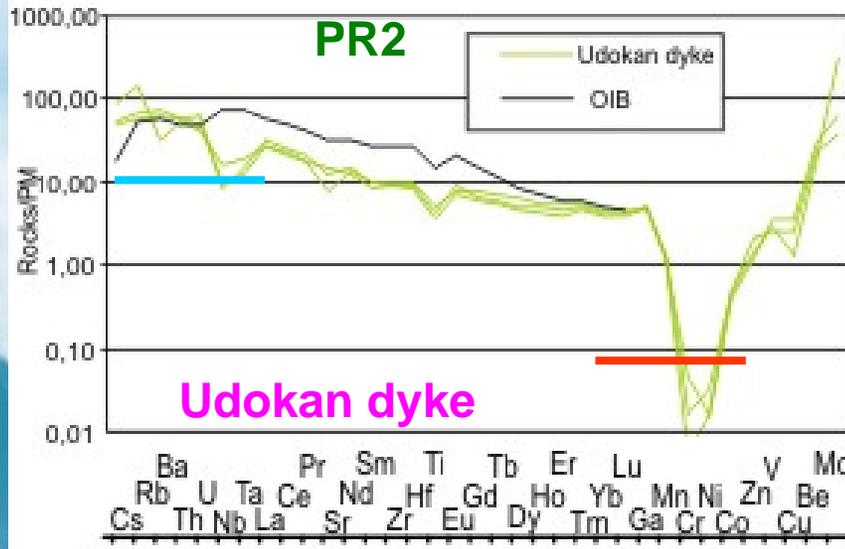
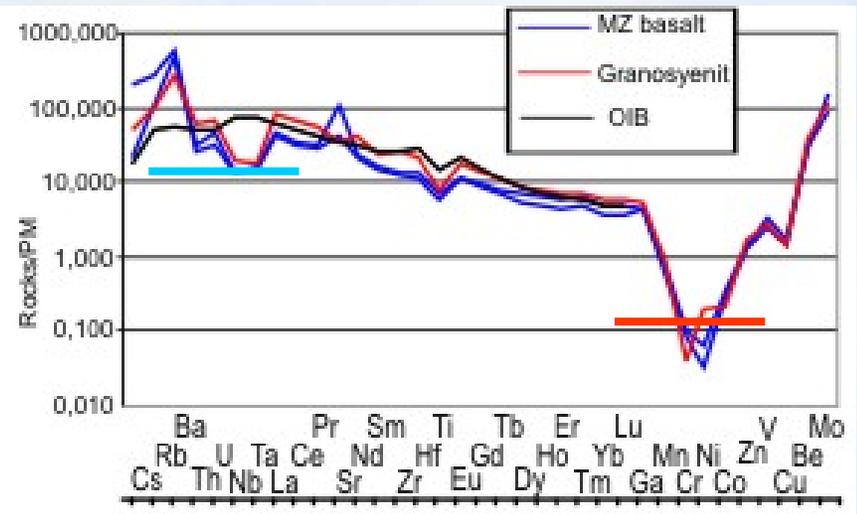
Copper deposits of different scale are the most important: the unique Udokan deposit of Cu sandstones and its satellite (the Sakinsky, the Unkur etc.) , Chiny PGE-Cu magmatic and the Pravoingamakitsky PGE-Cu hydrothermal.

Spider-diagrams of the magmatic rocks from the Kodaro-Udokan region

KZ – Udokan basalts

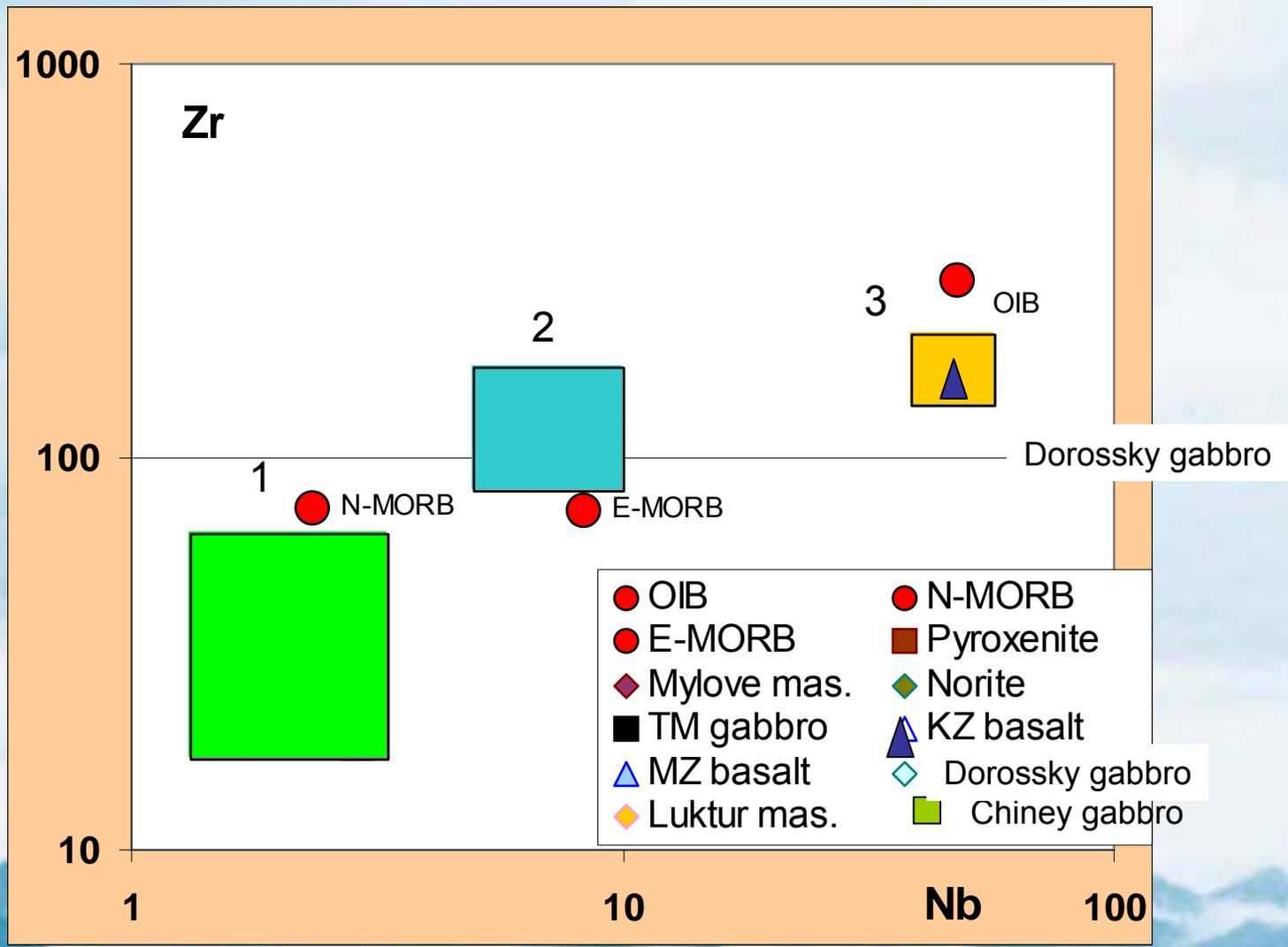


MZ-basalts



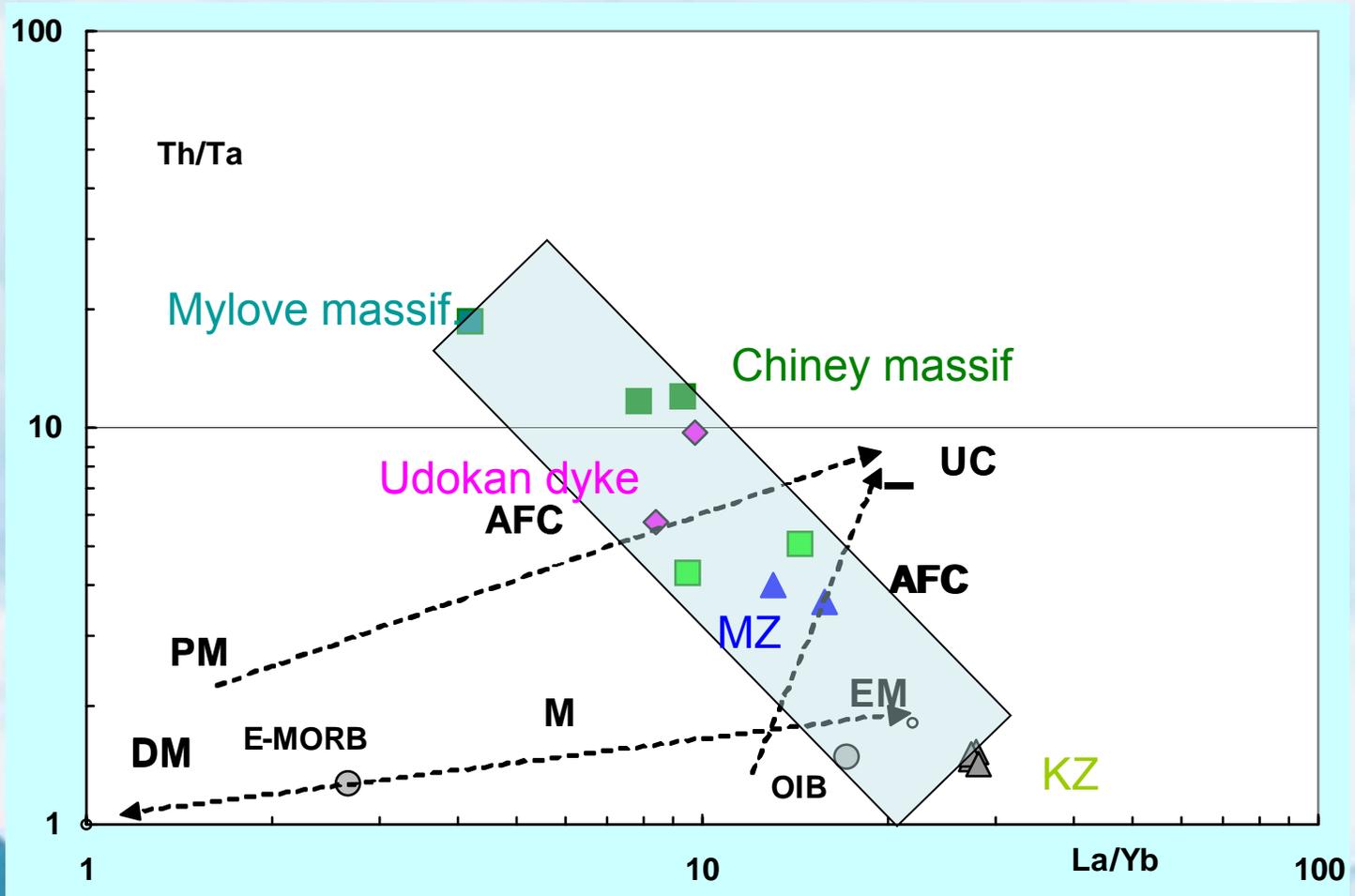
There is a evolution of composition of basic magmatic rocks from PR to Kz from E-MORB to OIB. Nb-Ta anomalous is the most typical for Chiney rocks, it decreases in range PR – MZ – KZ.

Diagram Nb-Zr for magmatic rocks of the Kodaro-Udokan region



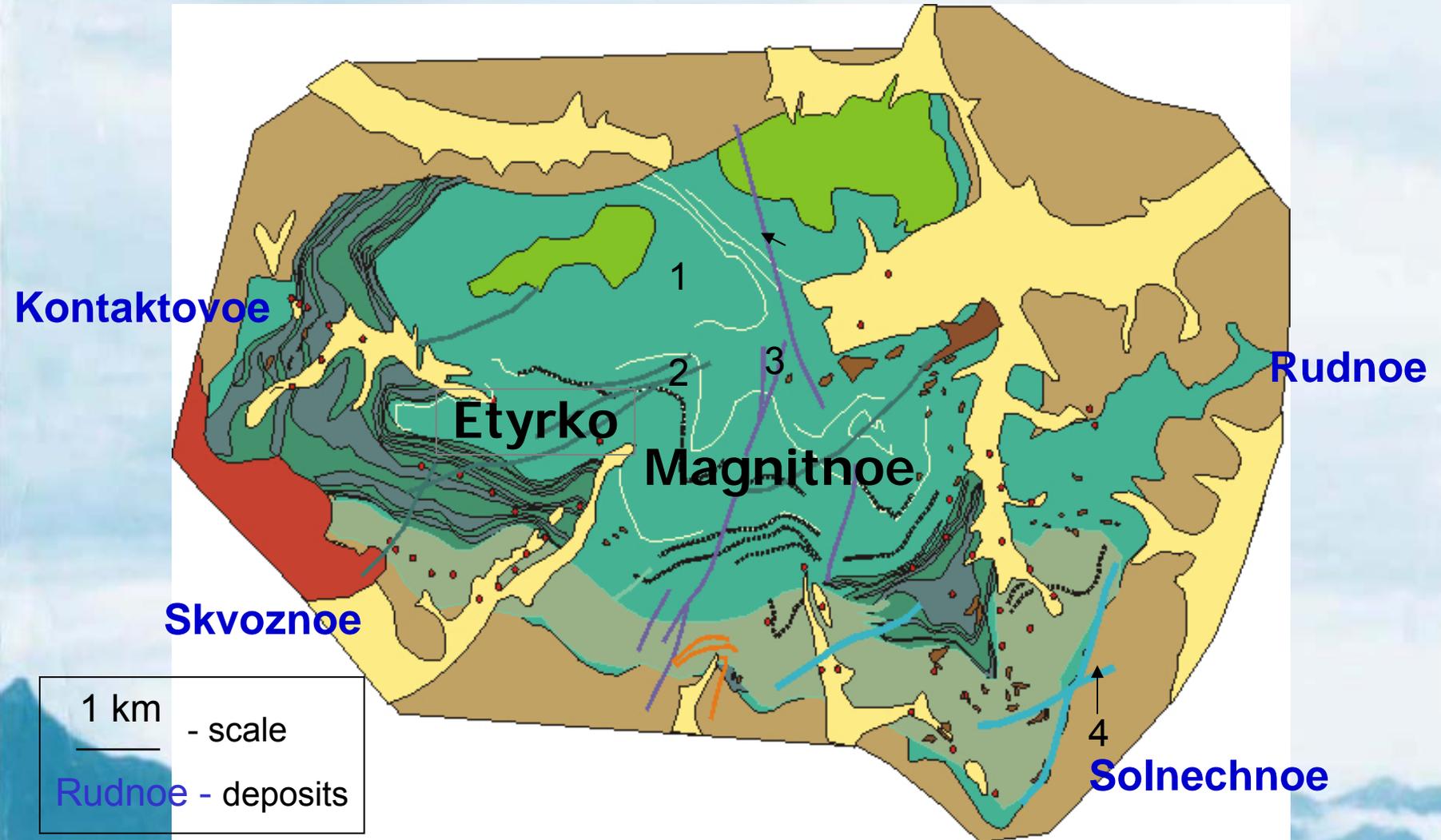
There are three groups of rocks: 1- gabbroides of chiney type (PR₁), 2 -gabbro of dorosky type (PR₂) and MZ basalt, 3 - KZ basalts basalts. They are close to N-MORB, OIB and E-MORB correspondingly.

Diagram Th/Ta – La/Yb



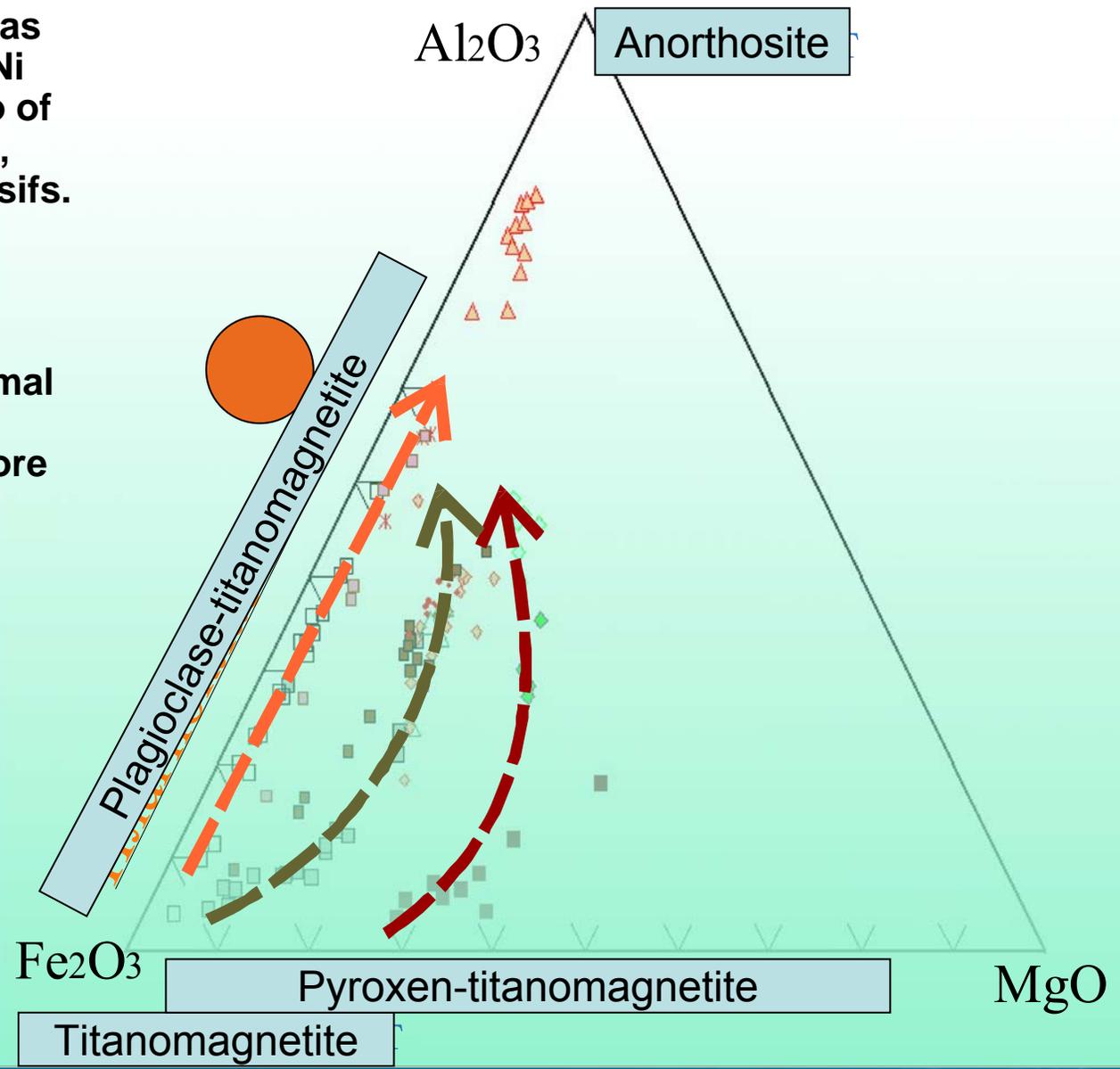
This diagram demonstrates the role of different sources in the origin of the magmatic rocks of the Kodaro-Udokan region. Contamination of core material is maximum in Chiney gabbro, and minimum – in KZ basalts.

Schematical map of the Chiney massif



All type of the magmatic rocks mentioned above were established in the structure of the Chiney massif. There are gabbro, titanomagnetite gabbro and anortosites formed for four stage PR_1 époque (1), dykes of dorossky type (2 - PR_2), dykes MZ (3) and dykes and basalts Kz (4).

Crystallization differentiation of chiney-type magmas formed the Pt-Cu-Ni deposits in gabbro of the Chiney, Luktur, Mylove et ctr. massifs. Residual melts enriched by H₂O, Cl, F, S created hydrothermal PGE-Cu veins of Pravoimgamakiskore deposit.



Conclusions

- 1. Ultrabasic-basic magmatism on the South of the Siberian Platform (Kodaro-Udokan region) took place during PR₁ – PR₂ – MZ - KZ;**
- 2. The role of mantle source in the origin of the magmatic rocks of the Kodaro-Udokan region increased from Paleoproterozoic to Cenozoic.**
- 3. Crystallization differentiation of chiney-type magmas formed the Pt-Cu-Ni deposits and residual melts enriched by H₂O, Cl, F, S created hydrothermal PGE-Cu veins.**

320 Ma orogenic
gold in Bodaibo
is controlled by
thrust faults
along oroclinal
axis - all
superimposed
onto
metamorphosed
Riphean



250 km



WELCOME

Мана

